

CLEAN VERSION OF PENDING CLAIMS

Serial No. 09/684,554

1. A composition comprising at least two recombinant adeno-associated viruses (AAV), comprising:
 - a) a first recombinant AAV comprising a first recombinant DNA molecule comprising linked:
 - i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
 - ii) a second DNA segment which does not comprise AAV sequences; and
 - iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV; and
 - b) a second recombinant AAV comprising a second recombinant DNA molecule comprising linked:
 - i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
 - ii) a second DNA segment which does not comprise AAV sequences and which second DNA segment is different than the second DNA segment of the first recombinant DNA molecule; and
 - iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV.
2. The composition of claim 1 further comprising a delivery vehicle.
3. The composition of claim 2 where the vehicle is a pharmaceutically acceptable carrier.
4. The composition of claim 1 wherein the second DNA segment of the first recombinant DNA molecule comprises a portion of an open reading frame operably linked to a promoter.
5. The composition of claim 4 wherein the first recombinant DNA molecule comprises a splice donor site 3' to the open reading frame.

6. The composition of claim 4 wherein the second DNA segment of the second recombinant DNA molecule comprises the remainder of the open reading frame which together with the second DNA segment of the first recombinant DNA molecule encodes a full-length polypeptide.
7. The composition of claim 6 wherein the second DNA segment of the second recombinant DNA molecule comprises a splice acceptor site 5' to the remainder of the open reading frame.
8. The composition of claim 1 wherein the second DNA segment of the first recombinant DNA molecule comprises an enhancer.
9. The composition of claim 1 wherein the second DNA segment of the first recombinant DNA molecule comprises a promoter.
10. The composition of claim 8 or 9 wherein the second DNA segment of the second recombinant DNA molecule comprises at least a portion of an open reading frame.
11. The composition of claim 10 wherein the second DNA segment of the second recombinant DNA molecule further comprises a promoter operably linked to the open reading frame.
12. The composition of claim 1 wherein the second DNA segment of the first recombinant DNA molecule comprises an origin of replication functional in a host cell.
13. The composition of claim 12 wherein the origin is a viral origin of replication.
14. The composition of claim 13 wherein the origin is functional in a human cell.
15. The composition of claim 12 wherein the second DNA segment of the first recombinant

DNA molecule further comprises DNA encoding a protein that binds to the origin of replication.

16. The composition of claim 15 wherein the second DNA segment in the second recombinant DNA molecule comprises at least a portion of an open reading frame.

17. The composition of claim 16 wherein the second DNA segment in the second recombinant DNA molecule further comprises a promoter operably linked to the open reading frame.

18. A recombinant adeno-associated viral vector comprising a heterologous origin of replication.

B1
19. (Amended) A recombinant adeno-associated viral vector comprising at least one heterologous transcriptional regulatory element functional in a host cell, which vector regulates, in the host cell, expression of a therapeutic gene in a second recombinant adeno-associated viral vector.

20. The vector of claim 19 wherein the element is a promoter.

21. The vector of claim 19 wherein the element is an enhancer.

22. A recombinant adeno-associated viral vector comprising a DNA sequence encoding a protein that binds to a heterologous origin of replication.

23. A plasmid comprising the vector of claim 18, 19 or 22.

24. A host cell contacted with the composition of claim 1.

25. A host cell contacted with at least two recombinant AAV,

wherein a first recombinant AAV comprises a first recombinant DNA molecule comprising linked:

- i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
- ii) a second DNA segment which does not comprise adeno-associated viral sequences; and
- iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV; and

wherein a second recombinant AAV comprises a second recombinant DNA molecule comprising linked:

- i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
- ii) a second DNA segment which does not comprise adeno-associated viral sequences and which second DNA segment is different than the second DNA segment of the first recombinant DNA molecule; and
- iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV.

26. A method to transfer recombinant DNAs to a host cell, comprising:

contacting the host cell with at least two recombinant AAV,

wherein a first recombinant AAV comprises a first recombinant DNA molecule comprising linked:

- i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
- ii) a second DNA segment which does not comprise adeno-associated viral sequences; and
- iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV; and

wherein a second recombinant AAV comprises a second recombinant DNA molecule comprising linked:

- i) a first DNA segment comprising a 5'-inverted terminal repeat of AAV;
- ii) a second DNA segment which does not comprise adeno-associated viral sequences and which second DNA segment is different than the second

DNA segment of the first recombinant DNA molecule; and

iii) a third DNA segment comprising a 3'-inverted terminal repeat of AAV

27. A method to transfer and express a polypeptide in a host cell comprising contacting the host cell with the composition of claim 1.

28. The method of claim 26 or 27 wherein the second DNA segment of the first recombinant DNA molecule comprises a portion of an open reading frame operably linked to a promoter.

29. The method of claim 28 wherein the first recombinant DNA molecule comprises a splice donor site 3' to the open reading frame.

30. The method of claim 29 wherein the second DNA segment of the second recombinant DNA molecule comprises the remainder of the open reading frame which together with the second DNA segment of the first recombinant DNA molecule encodes a full-length polypeptide.

31. The method of claim 30 wherein the second DNA segment of the second recombinant DNA molecule comprises a splice acceptor site 5' to the remainder of the open reading frame.

32. The method of claim 26 or 27 wherein the second DNA segment of the first recombinant DNA molecule comprises an enhancer.

33. The method of claim 26 or 27 wherein the second DNA segment of the first recombinant DNA molecule comprises a promoter.

34. The method of claim 32 wherein the second DNA segment of the second recombinant DNA molecule comprises at least a portion of an open reading frame.

35. The method of claim 33 wherein the second DNA segment of the second recombinant

DNA molecule comprises at least a portion of an open reading frame.

36. The method of claim 34 wherein the second DNA segment of the second recombinant DNA molecule further comprises a promoter operably linked to the open reading frame.

37. The method of claim 35 wherein the second DNA segment of the second recombinant DNA molecule further comprises a promoter operably linked to the open reading frame.

38. The method of claim 26 or 27 wherein the second DNA segment of the first recombinant DNA molecule comprises an origin of replication functional in a host cell.

39. The method of claim 38 wherein the origin is a viral origin of replication.

40. The method of claim 39 wherein the origin is functional in a human cell.

41. The method of claim 26 or 27 wherein the second DNA segment of the first recombinant DNA molecule further comprises DNA encoding a protein that binds to the origin of replication.

42. The method of claim 41 wherein the second DNA segment in the second recombinant DNA molecule comprises a portion of an open reading frame.

43. The method of claim 41 wherein the second DNA segment in the second recombinant DNA molecule further comprises a promoter operably linked to the open reading frame.

44. A recombinant adeno-associated viral vector comprising a DNA sequence encoding a protein that binds to a heterologous origin of replication for use in medical therapy.

45. A recombinant adeno-associated viral vector comprising a heterologous origin of replication for use in medical therapy.

46. The composition of claim 1 wherein the second DNA segment of one of the vectors comprises a heterologous transcriptional regulatory element.
47. The host cell of claim 25 wherein the second DNA segment of one of the vectors comprises a heterologous transcriptional regulatory element.
48. The method of claim 26 or 27 wherein the second DNA segment of one of the vectors comprises a heterologous transcriptional regulatory element.
49. (New) A method to enhance the expression of a polynucleotide in a host cell, comprising: contacting a host cell comprising a recombinant AAV vector comprising a polynucleotide segment which encodes a polypeptide, with a composition comprising a further recombinant AAV vector corresponding to the vector of claim 19 in an amount which enhances expression of the polynucleotide.
50. (New) A method to enhance the expression of a polynucleotide in a host cell, comprising: contacting a host cell comprising a recombinant AAV vector corresponding to the vector of claim 19, with a composition comprising a further recombinant AAV vector comprising a polynucleotide segment which encodes a polypeptide, in an amount which enhances expression of the polynucleotide.
51. (New) A method to enhance the expression of a polynucleotide in a host cell, comprising: contacting a host cell with a recombinant AAV vector corresponding to the vector of claim 19 and a further recombinant AAV vector comprising a polynucleotide segment which encodes a polypeptide, in an amount which enhances expression of the polynucleotide in the cell.
52. (New) The method of claim 49 or 50 wherein the composition further comprises a delivery vehicle.

53. (New) The method of claim 52 wherein the delivery vehicle is a pharmaceutically acceptable carrier.
54. (New) The method of claim 49, 50 or 51 wherein heterologous transcriptional regulatory element in the recombinant AAV corresponding to the vector of claim 19 is a promoter.